

Application No.: 09/870280

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Docket No.: MWS-040RCE

NOV 20 2006**REMARKS**

Upon entry of this paper, claim 10 has been cancelled and its features have been added to claim 9. It should be appreciated that this amendment was made for purposes of clarifying claim 9 and was not made for purposes of patentability. Claims 1-36 are presently pending in this application. No new matter has been added. Applicants contend that the claims are patentable and in condition for allowance. Applicants respectfully request reconsideration of the outstanding rejections in view of the comments set forth below.

I. Summary of Rejections

The Examiner rejects claims 1-36 under 35 U.S.C. §101. The Examiner rejects claims 1, 2 and 8-36 under 35 U.S.C. §102(b) as being anticipated by Matlab News and Notes (February 2000). The Examiner rejects claims 2-7 under 35 U.S.C. §103(a) as being unpatentable over Matlab News and Notes (February 2000). Applicants respectfully traverse the rejections as discussed below.

II. Claim Rejections under 35 U.S.C. § 101

Claims 1-36 stand rejected under 35 U.S.C. § 101. Applicants respectfully traverse this rejection and contend that these claims recite statutory subject matter under 35 U.S.C. § 101. 35 U.S.C. § 101 states

“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”

In order for a claim to be statutory subject matter, it must fall within of the statutory categories. Claims 1-20, 29-32, 35 and 36 fall within the statutory category of a “new and useful process.” Claims 21-24 and 33 fall within the statutory category of a “manufacture.” Claims 25-28 and 34 fall into the statutory categories of a “machine.” These claim sets will be discussed separately below.

Application No.: 09/870280

Docket No.: MWS-040RCE

A. The Examiner's Rejection

The Examiner states

"Claims 1-36 are rejected under 35 U.S.C. 101 because the limitations reflect non-statutory subject matter involving signal theory with no specific application. For example, the specification on page 7, lines 6-21, claim no specific application to which the signal block identities and applications are unknown. If a claimed process manipulates only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the claim is not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30 USPQ2d at 1458-59. The Federal Circuit also recognizes that the fact that a nonstatutory method is carried out on a programmed computer does not make the process claim statutory. Grams, 888 F.2d at 841, 12 USPQ2d at 1829 (claim 16 ruled nonstatutory even though it was a computer-implemented process).

A product is a tangible physical article or object, some form or matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. *A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.*

On the other hand, from a technological standpoint, a signal encoded with functional descriptive material is similar to a computer-readable memory encoded with functional descriptive material, in that they both create a functional interrelationship with a computer. In other words, a computer is able to execute the encoded functions, regardless of whether the format is a disk or a signal." (See Office Action, p.3, § 4).

B. Process Claims (Claims 1-20, 29-32, 35 and 36)

Claims 1-20, 29-32, 35 and 36 are directed to processes. The useful, concrete and tangible benefits of the claimed processes are described in more detail below.

Applicants respectfully submit that the Examiner is misconstruing what is being claimed in these process claims. Applicants are not claiming a signal, as in a form of energy, per se in these process claims. "Signal" or "signals" as used in these claims is not intended to refer to physical signals that constitute forms of energy but rather are intended to refer to "streams of values," (See p.7, lines 6-8 of the present application) within a "modeling process" or "modeling environment." Steps are recited in these claims that include the term "signal," but there are no claims to a mere signal or to mere manipulation of signal as a form of energy, as alleged by the Examiner.

Application No.: 09/870280

Docket No.: MWS-040RCE

Moreover, claims 1-20, 29-32, and 35-42 are not directed to purely abstract ideas, laws of nature or to manipulation of the same. Instead, the processes, as recited in claims 1-20, 29-32, 35 and 36, have practical application. Outputting a composite signal improves, among other things, modeling process cycle times. Furthermore, composite signals result in an efficient graphical representation of a block diagram model, which in return simplifies the validation and the integration of individual block diagrams. (See Present Application, Figs. 6 and 7). Composite signals, as recited in claims 1-20, 29-32, and 35-42, reduce memory requirements for graphical representation of the block diagram model as compared to when models do not use composite signals. For example, processing a composite signal in the processor is faster than processing each single signal individually since function-call overhead in the processor for processing each single signal individually is eliminated, (Detailed Description, p.13, lines 6-10). This faster processing represents a useful and tangible result. Accordingly, Applicants submit that claims 1-20, 29-32, 35 and 36 are directed to statutory subject matter and urge the Examiner reconsider the 35 U.S.C. §101 rejection of claims 1-20, 29-32, and 35-42. Applicants further request that the Examiner pass claims 1-20, 29-32, and 35-42 to allowance.

C. Manufacture Claims (Claims 21-24 and 33)

Claims 21-24 and 33 are directed to a "computer program product residing on a computer-readable medium." Such claims have been deemed to be directed to articles of manufacture and thus, to patentable subject matter. In re Beauregard, 53 F.3d 1583, 35 U.S.P.Q.2d 1383 (Fed. Cir.1995). These claims parallel the corresponding method claims and have practical utility for at least the reasons discussed above relative to the method claims. As such, claims 21-24 and 33 are product claims that recite patentable subject matter under 35 U.S.C. § 101. Applicants respectfully request that the Examiner withdraw the 35 U.S.C. §101 rejection of claims 21-24 and 33. Reconsideration and allowance of claims 21-24 and 33 is respectfully requested.

D. Machine Claims (Claims 25-28 and 34)

Claims 25-28 and 34 are product claims that recite patentable subject matter under 35 U.S.C. § 101. These claims fall under the statutory category of a machine. The processor and memory recited in these claims are tangible physical objects and not mere abstractions.

Application No.: 09/870280

Docket No.: MWS-040RCE

Moreover, the processor and memory are configured to yield useful and tangible results. For example, claims 25-28 recite "group the plurality of output signal values as an ordered set in a multiplexer as a first composite signal and output the first composite signal." As discussed above, the composite signals have a real world value, such as, improving modeling process cycle times, simplifying the validation and the integration of individual models, and reducing the memory requirements for graphical representation of models. Therefore, the subject matter of claims 25-28 is statutory. Similarly, the processor and memory of claim 34 parallels the process recited in independent claim 33. Claim 34 recites "group the output signals as an ordered set in a multiplexer as a composite signal." The subject matter of claim 34 is statutory. Applicants respectfully request that the Examiner withdraw the 35 U.S.C. §101 rejection of claims 25-28 and 34. Reconsideration and allowance of claims 25-28 and 34 is respectfully requested.

Based on the above arguments, Applicants respectfully submit that outputting and processing a composite signal is a useful, tangible and concrete result. As such, Applicants submit that claims 1-36 are directed to statutory subject matter.

III. Claim Rejections under 35 U.S.C. § 102(b):

Claims 1, 2, and 8-36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Matlab News and Notes (February 2000), hereafter "MNN," (Office Action, p.4, § 6). Applicants respectfully traverse this rejection.

A. Novelty of Claims 1, 2 and 8-36

Applicants respectfully traverse the rejection of claims 1, 2 and 8-36.

1. Independent Claims 1, 14, 21, 25, 29, 33, 34

Claims 1 and 14 provide "grouping the plurality of output signal values as an ordered set in a multiplexer as a first *composite signal*." Claims 21 and 25 similarly provide "group the plurality of output signal values as an ordered set in a multiplexer as a first *composite signal*." And claims 29, 33, and 34 each provide "grouping" (claim 29) or "group" (claims 33 and 34) output signals "in a multiplexer as a *composite signal*" (claims 29, 33, 34).

Application No.: 09/870280

Docket No.: MWS-040RCE

MNN discusses the concept of multirate filters as a practical approach to the design and implementation of finite impulse response filters with narrow spectral constraints. While describing multirate bandpass and highpass narrowband designs, MNN describes quadrature modulation requiring a complex signal with real and imaginary parts. This design is illustrated with block diagrams in Simulink® software in MNN. The block diagram illustrated on MNN Figure 5 uses the complex signal denoted by (c). (See MNN, p.13). MNN discusses complex signals that have real and imaginary parts.

A composite signal is different from a complex signal in that a composite signal is formed of an ordered set of a plurality of single signals, while a complex signal is a single signal that is the sum of a real part and an imaginary part, that may be denoted as $m(n)=f(n)+j*g(n)$. In this representation, $m(n)$ is a complex signal with $f(n)$ being the real part and $g(n)$ being the imaginary part.

First, MNN does not disclose composite signals as required by the independent claim 1. Independent claim 1 discloses "grouping the plurality of output signal values as an ordered set in a multiplexer as a first composite signal." A composite signal represents an ordered set of signals that are bundled together to form a single entity. Signals in a composite signal can have different attributes, i.e., name, data type, numeric type, dimensionality, (Detailed Description, p.7, lines 15-18). Therefore, the composite signal is a general facility for grouping and splitting a set of heterogeneous or homogeneous signals without loss of information, (Detailed Description, p.7, lines 18-21). As previously stated above, this is different from a complex signal as disclosed in MNN.

Second, MNN does not disclose "grouping" or to "group" "the plurality of output signal values as an ordered set in a multiplexer as a first composite signal," as respectively recited in claims 1, 14, 21, or 25. The block diagram illustrated in MNN Figure 5 shows how to use modulators to multiply a single signal with a complex function, (MNN, p. 13). The modulator in MNN outputs a signal, denoted as "double (c)", which is a complex signal equal to the input multiplied by a discrete complex exponential modulation function, $m(n)$. The output signal disclosed in MNN is still a single signal. MNN does not disclose "grouping the plurality of output signal values as an ordered set in a multiplexer as a first composite signal." As such

Application No.: 09/870280

Docket No.: MWS-040RCE

MNN also does not disclose the "grouping" or to "group" "output signals as an ordered set in a multiplexer as a *composite signal*," as in claims 29, 33, or 34.

Applicants respectfully submit that they are well versed with the technology referenced in MNN. Applicants respectfully submit that the reference does not disclose "grouping" or to "group" "the plurality of output signals as an ordered set in a multiplexer" as a "composite signal" as recited respectively in independent claims 1, 14, 21, 25, 29, 33, or 34. Nor does MNN disclose the "outputting" or "output" of a "composite signal," as recited respectively in independent claim 1, 14, 21, 25, 29, 33, and 34. For at least these reasons, MNN does not anticipate claims 1, 14, 21, 25, 29, 33, and 34. Applicants respectfully request that the 35 U.S.C. §102(b) rejection of claims 1, 14, 21, 25, 29, 33, and 34 be withdrawn. Applicants further request reconsideration and allowance of claims 1, 14, 21, 25, 29, 33, and 34 in view of these remarks.

2. Dependent Claims 2, 8-13, 15-20, 22-24, 26-28, and 30-32

Claims 2, 8-13, 15-20, 22-24, 26-28, and 30-32 depend from independent claims 1, 14, 21, 25, 29, and 34 and, as such, incorporate each and every element of these independent claims. Therefore claims 2, 8-13, 15-20, 22-24, 26-28, and 30-32 are not anticipated for at least all the reasons argued above. Applicants respectfully request that the 35 U.S.C. §102(b) rejection of claims 2, 8-13, 15-20, 22-24, 26-28, and 30-32 be withdrawn. Applicants further request reconsideration and allowance of claims 2, 8-13, 15-20, 22-24, 26-28, and 30-32 in view of these remarks.

11. Claim 35-36

Independent claims 35 and 36 also disclose the feature of a "composite signal." As shown above, MNN does not disclose composite signal. As described above, the language identified by the Examiner as disclosing these limitations refers to a *complex* signal, not a *composite* signal, (Office Action, p.11). In view of above the reasons, Applicants respectfully request the Examiner to withdraw the rejection to claims 35 and 36 under U.S.C. § 102, and pass the claims to allowance.

Application No.: 09/870280

Docket No.: MWS-040RCE

IV. Claim Rejections under 35 U.S.C. § 103(a):

Claims 2-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over MNN, (Office Action, p.12, § 9). Applicants respectfully traverse this rejection.

Claims 2-7 depend from claim 1, and as such incorporate each and every element of claim 1. Claim 1 recites the feature of "grouping a plurality of output signal values as an ordered set in a multiplexer as a first composite signal."

MNN fails to teach or suggest composite signal and grouping the output signals as an ordered set in a multiplexer as a composite signal, as required by claim 1. Rather, MNN discusses *complex* signals that have real and imaginary parts. As explained above, a composite signal is not the same as a complex signal. A composite signal is an ordered set of a plurality of signal values. In claim 1 a composite signal is formed in a multiplexer. On the other hand, a complex signal is a single signal that is the sum of a real part and an imaginary part, that may be denoted as $m(n)=f(n)+j*g(n)$. MNN fails to teach or suggest *composite* signals.

The MNN language identified by the Examiner as teaching the features of claims 2-7 refers to creating sophisticated GUIs, displaying results in two-dimensional plots or with three-dimensional visualizations, and choosing from several hundred types of mathematical operations, (Office Action, p.13, § 10). Claim 2 teaches "each of the blocks includes at least one output signal port." Claim 3 teaches "a plurality of input signal values and output signal values have at least one attribute." Claims 4-7 further teach, respectively, the attributes being "name," "data type," "numeric type," and "dimensionality." The attributes of claims 4-7 are the attributes of the input and output signal values. The attributes taught in claims 4-7 are different than amplitude/phase/frequency attributes that are used for graphical illustrations of sinusoidal signals processing analysis identified by the Examiner as being disclosed in MNN, (Office Action, p.13, § 10). The attributes of claims 4-7 are not used to create sophisticated GUIs to display 2D and 3D results, as taught by MNN (p.6, left col., § 3, lines 5-8).

Accordingly, Applicants request the withdrawal of the rejections directed towards claims 2-7 under 35 U.S.C. § 103, and pass claims 2-7 to allowance.

NOV 20 2006

Application No.: 09/870280

Docket No.: MWS-040RCE

CONCLUSION

In view of the above comments, Applicants believe the pending application is in condition for allowance and urge the Examiner to pass the claims to allowance. Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants attorney at (617) 227-7400.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-040RCE. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

In view of the above remarks, Applicants believe the pending application is in condition for allowance.

Dated: November 20, 2006

Respectfully submitted,

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